

## ABSTRACT

A resin charged media can be a single or layered construction needed together to provide a graded-density structure of fine fibers intermixed with finer fibers. This resulting media possesses a higher particulate loading retention capability, particularly early in the filtration cycle, relative to other cellulose, spun-bonds, or other similar materials commonly applied to filtration applications where filtration is predominantly a surface-loading phenomenon. The filtration media provides for depth filtration with the multi-layered needled layers, thereby enhancing the overall particulate-holding capacity of the charged media. This results in more resistance to fine particulates and improvements in efficiency due to increased sub-micron particle loading. With the filter media consisting of a graded structure, surface loading phenomenon can be reduced and filter life improved. Since the layers in the media are physically combined using needling technology, they will not separate. Being constructed of synthetic, melt-bondable fibers, the charged filter media can be formed into various shapes, sizes, and configurations through conventional and other thermal-forming techniques such as hot air, seal bar, ultrasonic, or vibration welding.